Space Weather Forecast

Issued on Saturday, 28 October 2023 at 13:24 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Fast solar wind influence Days 2-3 (29-30 Oct) with Minor to Moderate Geomagnetic Storms expected.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low with x-ray activity at background levels with isolated Common class flares observed. There are currently five numbered regions on the visible disc, all of which are small and simple. Most regions are showing signs of gradual decay. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind started at slightly elevated levels around 440 km/s and gradually declined to background levels but before then becoming slightly elevated again after 28/0600 UTC. The strength of the solar wind's magnetic field was initially weak before then rising to reach Moderate levels after 28/0200 UTC. The important north-south component has been mostly orientated southward and has fluctuated between weak and moderate levels. Geomagnetic activity has been at Quiet to Unsettled levels.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Very Low or Low solar activity is expected, with isolated Common Class flares. There is a slight chance of isolated Moderate class flares, mainly from AR3473.

Solar Wind / Geomagnetic Activity: The next solar wind enhancement is expected to arrive by Day 2 (29 Oct) from large coronal hole features. The solar wind is expected to become elevated to strong. Unsettled to active geomagnetic activity is expected until the arrival of the high speed stream (HSS). Then Minor to Moderate Geomagnetic Storms are most likely Days 2-3. Activity is then expected to decline during day 4 (31st) as the influence of the HSS wanes.
The auroral oval is expected to see enhancement Days 2-3 (29-30 Oct) due to arrival of the fast solar winds. As such, the aurora may be visible across Scotland and Northern Ireland under clear skies.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	50	70	80	50
Strong	G3	No	1	10	10	5
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	5	5	10	10
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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